American Electro-platers' Society

(An Educational Society)

Chartered 1909

MONTHLY REVIEW

JULY, 1915

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I shall pass through this world but once. Any good thing, therefore, that I can do, or any kindness that I can show to any human being, let me do it now. Let me neither defer nor neglect it, for I shall not pass this way again.—*Amiel.*

MONTHLY REVIEW

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Vol. 2 JULY, 1915 No. 2

EDITORIAL.

As was announced in the June number of the "Review," the editor will outline a policy or plan of management of the "Review" during his encumbency of the editorial chair.

He does not contemplate a radical departure from customs that have become habit, but rather will attempt to shape habit so it will conform to the demands of today. The "Review" has been published as a monthly for more than a year, and previous to becoming a monthly it was published as a quarterly for about three years. It has been and is the medium by which the Branches and members obtain the news of what is going on in the Society, and it has done its share toward building up the membership, and giving publicity to the society's objects.

In the course of its existence there have appeared in it many articles not technical. Some of these were the addresses of men made at open meetings and at banquets of the Branches, and the writer believes that it was proper and in place to print them, for they served a definite purpose. Through them men qualified to speak on the subjects they handled, gave to the plate a knowledge of what the Society was, and without question aided in spreading the influence of the Society more than any other one thing could. But, as said above, they served their purpose, and the editor believes that the membership could no longer be increased by printing such addresses now. Nor would they do any good otherwise, so in future issues, such articles will not appear.

At the last convention it was said that the "Review" was nothing but a newspaper, and while the editor admits that it contains some news, he also believes that it contains some news that is welcome to the great majority of the members, and as the members pay for it, they are entitled to what they pay for. So the news of the Branches will be printed as heretofore, and Secretaries are requested to send in live news items of interest to the membership.

Reports of open meetings and banquets will be welcomed, but after-dinner speeches, unless they be of unusual interest or be technical papers, will not be printed. The editor does not believe that money should be spent for printing the speech of anyone, though it may be a good speech, if it is not such that it will benefit the Society, by imparting knowledge on electroplating, or have

some bearing on the aims and objects of the Society. In short, all papers to be printed during the next year, must be of an educational nature.

Suggestions will be welcomed, and the aid of every member is earnestly solicited. As was said last month, the "Review" will be just what you make it, and while it is the editor's duty and office to get it printed and see that it reaches you, it does not reflect his work, except physically, but it does reflect the work of the Society. If you, as an individual, do your duty as a member, and contribute what you can to its columns, it will be good and it will faithfully reflect the mental makeup of our membership. You have it in your power to make that reflection flattering to you, or the contrary. You have it in your power to make the "Review" a credit to the A. E. S. and every member of it. Will you do it?

The road to success is open to all. The trouble with many is they want to get there without going.

Don't envy your fellow plater because he has a better job. Study your business and make your own better.

Ever notice how much better you feel after you've made some other fellow feel better?

The wise plater uses his stumbling blocks as stepping stones to success.

When a plater is confronted with two evils, he should choose something else.

A mile a minute is going some, but we believe a smile a minute will go longer.

MR. HOGABOOM'S ADDRESS

We often hear the remark or read of electro plating still being in its infancy, but seldom, if ever, give enough thought to what that really refers. The passing thought is generally to the trade itself, as a whole, and yet when given the rightful consideration, nothing could be farther from the truth. As an industry, electro plating ranks among the foremost for its application is universal, and on every hand can be seen some evidence of the platers' art. When it was suggested that an industrial exposition be held where everything that owed its existence or any of its ornamentation to electro plating few even dreamed of the magnitude of such an undertaking.

Probably it is because of the enormity of such an undertaking that no one has as yet attempted it, and still, if such an exposition were held, it would comprise the vast majority of the industries of this country, and prove to be the greatest of all exhibits. At first one thinks only of jewelry, stove parts and nickel-plated articles in general. They form only a minor part, for some things owe their very existence to the ingenuity of the electro-plater and unless one's attention is called to the fact it would be passed unnoticed. Take, for instance, the records of the phonograph that reproduce the sweetest notes of human song birds. These would never have been known unless the electro-plater had successfully formed the molds into which the record is molded. Suppose the electrolytic refining of copper was suddenly stopped. How would the warring nations obtain enough copper to supply their needs? The success of the war depends upon the electro-platers' art, for even the little propeller that guides the deadly torpedo of the submarine has been copper plated.

Surely an industry that is interwoven with so many other industries and has added so much to the advancement of civilization and to the enjoyment of mankind and to the beautifying of his home and to pleasure of life cannot be called an infant.

Wherein, then, is electro plating in its infancy? It cannot be in its application, for although its existence has barely passed the three score and ten span of man's life, it would be folly to say it has not attained the stature of man. It may not have attained its full growth, but surely swaddling clothes have long ago been laid aside.

Then to what can it refer? To the method of its application, more especially to the application of the art as is represented by the work done by the members of this society. Electro refining is based upon definite principles, the electricity used is definitely measured, the solutions used are kept at a standard, the cost of production is a known factor and the results obtained are uniform. In electro-plating, as we know it, has the same careful research work been applied? Are the solutions kept at a standard? Do we really understand all the principles of electro plating?

Can we obtain the same result day after day or are the solutions that have been so often cuddled and coaxed, stormed at and praised, ashamed to acknowledge, boastfully proud of, still a source of reproach? Is it not true that the knowledge of the solutions we use and the control of them place us on the infant roll?

Let us see if that assumption is correct. In 1855 Alfred Roseleur published a formula for a brass solution, that one recalcitrant child whose incorrigibility is too well known. It called for

Carbonate of copper	100 grammes.
Carbonate of zinc	100 grammes.
Carbonate of soda (crystals)	200 grammes.
Bisulphite of soda	200 grammes.
Cyanide of potassium pure	200 grammes.
Arsenious acid	2 grammes.
Water	10 litres.

In one of the latest books on electro-plating the following formula is recommended:

Copper sulphate	250 grammes.
Zinc sulphate	250 grammes.
Ammonia (0.880)	Q. S.
Potassium cyanide	Q. S.
Water	5 litres.

In both of these formulas the salts of the metal are given regardless of their purity or their metal content. Plating is based upon the principles of chemistry yet what chemist would make a solution if he did not know the quality of the salts to be used. The plater on the other hand has as a child obeys its parents implicitly followed the recipe given and trusted Providence for the survival of his offspring.

It is not intended to convey the idea that the formulas given will not give good results, they will, but the point to be emphasized is that the real content of the solution, the actual metal value and the free cyanide content is not given. It is the instructions to the school boy and not to the full grown man, and it is because of that method of giving the formulas for solution that the plater is still in his infancy in regard to the actual knowledge of their construction and control. Had the basic principles been given, had the solution values been explained an educational society such as this would be on the same level as its kindred societies in the allied industries.

Suppose a solution was made which contained carbonate of copper and the salt was purchased in the open market, the commercial product being used. One plater would obtain a salt containing say 52% metal with only traces or less than 1% of sulphates present. Another would probably get only 40% metal and as high in sulphates as 20% as SO_4. Would the two obtain the same results if the same formula was followed? That is not a case of mere supposition but salts of that content are sold as

basic copper carbonate and all because the plater has not left the swaddling clothes and demanded a uniform product.

The solutions may have the same specific gravity and if as is often the case, the hydrometer reading is taken as the basis of their condition how can the solution be corrected if it does not give satisfactory results?

Generally the anode is the barometer and hypodermic injections of one or the other of the salts used is administered in varying quantities in rapid succession. Here is a prescription for a sick brass solution. Hawkins says platers are like doctors, so here's what must be done.

"If the deposit be too slow, he (the plater) will try whether the bath will absorb the salts of copper and zinc, without the addition of cyanide."

"If the coat of brass has an earthy and ochreous appearance, especially if the liquor be blue or green, he will add cyanide until perfect decolorization takes place."

"If the deposit be dull and unequal, a small quantity of arsenious acid, dissolved in cyanide, is needed."

"If the deposit be too red, the operator will add salt of zinc, alone, or dissolved in cyanide."

"If the deposit be too white, or of a greenish white color, he will add the salt of copper alone, or dissolved in cyanide."

"Lastly, when, after long use, the bath has become overloaded with salts, the specific gravity too great for the easy passage of the electric current, the liquor must be diluted with water until it works satisfactorily."

What an indefinite and unsatisfactory method, yet we have followed the prescription to the letter and many of us yet are still in the kindergarten and have these lines learned by note and can almost say them backwards, so familiar are we with them.

If in any other branch of electro-chemistry an author were to give such unsound and arbitrary rule of the thumb methods, his whole work would lose its value and his general knowledge of the science be discounted.

It is due to the lack of the development of the theoretical part of electro-plating that conditions are such as they are. What is needed is more research work along the lines of real value. In an industry with so many changes as there are in electro-plating there can be no development without the application of theoretical chemistry. On the other hand the work to be of value must be along commercial lines developing that which has in its crude way produced results. We do not wish to criticize but of what value to the electro-plater would be a solution that would clean and nickel plate at the same time? The necessary effort to carry on such work would be of more value if directed to a comparative study of the value of additional agents, such as, bisulphite of soda, carbonate of soda, ammonia, arsenious acid,

etc., to a brass or copper solution.

It is due to the lack of knowledge of theoretical chemistry applied to electro-plating that there has been during the past few years such a flood of plating salts prepared for immediate use. Like soups, add hot water and serve. Would they have survived as long as they have, or rather would they ever have appeared if the plater had been trained in the theoretical knowledge of his work?

The chemists who developed those salts knew that the principles of electro-plating solutions were little understood by either the plater or his employer and that he could reap a harvest as long as he could cover the salts with big letters of the words "Efficiency," "Production." He knew and all his associates knew that sooner or later the solutions would be discarded, but they made hay while the sun was shining and the harvest was gathered in and the employer and the plater left the stubble.

More real advancement has been made by the members of this society in electro-plating in the past few years than has been recorded in any of the books on the subject. It is doubtful whether even now, a foothold could be obtained by any prepared salt. The start has been made and the demand for knowledge will increase and with it will come better products to work with. The infant's food of today will not answer for tomorrow.

To understand a solution there seems to be four phases of it that need to be considered. The salts, both chemical and metallic, are first. Their purity and general composition must be known. The second essential is to know in what proportion they should be added to a solution. Then their effect must be considered. The third requisite is what effects the anode efficiency. And then what control the current has over a solution. To better illustrate the points given, let us go through the making of the brass solutions, given in the first part of this paper. Roseleur's formula is more generally followed than any other. Probably not the exact proportions but the chemicals used are more commonly employed.

The solution is to be made with the carbonates of copper and zinc, about equal parts are recommended.

When those salts are used unless they are made by the plater himself or purchased according to certain specification, it is most essential that the metal content and impurities be ascertained. been recorded in any of the books on the subject. It is doubtful Theoretically, basic copper carbonate can have as much as 59% metal, but of the commercial grades if from 52 to 55% is obtained, it may be considered very good. It should also be free from sulphates which may be present from careless washing or by having sulphate of copper itself present. It is argued that the sulphate present does not effect the solution and if the required metal content is present that is sufficient. We are not prepared to say just what effect sulphates have in a cyanide solu-

tion, but we do know it is an impurity and will gradually accumulate, which in itself is an argument against its use.

Carbonates themselves are not of any real value to a solution after the content is above a certain point. To use the carbonates of the metals means that every time a pound of a carbonate, say carbonate of copper, is added to the solution, approximately one-third of the pound will become a carbonate of sodium or potassium. This added to the carbonates found by decomposition by electrolysis and the action of CO and CO_2 of the air on the solution will increase the content to such a degree that a solution will rapidly age. The specific gravity of the solution will materially increase, a greater amount of current will be consumed, a lesser deposit ratio will be had and the solution itself will be more difficult to control and will necessitate the treatment before recommended of removing part of it and adding water.

To show how the carbonates will accumulate in a solution even when the carbonates of the metal is not added, it is interesting to note a silver solution mentioned by Barclay & Hainsworth which contained 13 oz. to the gallon. We know of one which had 32.5 oz. of NA_2 CO_2, but in that case the carbonates of a metal had been used. The authors mentioned are of the opinion that carbonates in excess have little effect upon the working of the solution and state that the one given plated with "completely satisfactory results." It would be interesting to know just what the results were in relation to anode efficiency, decomposition of the cyanide, current consumption, and the ratio of deposit as compared to that which would be obtained from a solution relatively free from carbonates. Such research work along the lines suggested would be of much value and we hope to see a book published some day with comparative results from different solutions.

A copper solution was given to work and upon analysis it was found to contain 3.8 oz. of NA_2 SO_4 and 32.5 oz. of NA_2 CO_3. The solution was originally made from carbonate of copper and replenished with the same salt with occasional additions of sulphite of copper, commonly known as red copper compound. To deposit a certain amount of metal in a given time it was necessary to run the solution at 140° F., using 10 volts and 3000 amperes. The tank contained 1,200 gallons. That solution was discarded and a new one made, the carbonates naturally being very low. With 5 volts and 1,200 amperes three times the amount of metal was deposited in the same length of time and the temperature used was but 100° F. Evidently the current was consumed in breaking down the cyanide which lead to be added quite often and also in overcoming the resistance of such a large amount of useless salts. Carbonates will accumulate naturally in a solution, then why continually add a carbonate of the metal to increase it when it does no good and in all probability is a direct detriment.

Bisulphite of soda is an acid salt and when added neutralizes a large amount of the cyanide, the ratio being five parts of the soda will neutralize one part of cyanide. The soda then will be in the sulphite form and if that is to be added at all why not in that form? Solutions can be successfuly operated without it and as a simple solution is wanted why use it at all?

If, as recommended in the other formula given, the sulphates of copper and zinc are used it is necessary to neutralize the acid with aqua ammonia. Sulphate of ammonium is formed and if more aqua ammonia is added it will give a very unstable solution. Almost all of the ammonium salts are easily decomposed under the current and if they are not continually added their absence will materially affect the color of the deposit. Not being able to control the content of ammonia in a brass solution to any degree of certainty the results are most sure to vary and a continual doctoring of the solution will be found necessary.

Ammonia is added as a brightener or to clarify the anodes. If used for the first purpose it will be found that as in the case of nearly all "brighteners" the deposit ratio is decreased. It has been noted that when ammonia has been used, the deposit ratio will decrease as much as 20%.

Arsenious acid is most treacherous, as we all know, and to use it successfully one must be adept in the art of juggling. It has finally a very bad effect upon a solution. It can and is used successfully by some platers but many times much worry is needlessly endured. It has the effect even to a more marked degree than that of ammonia of decreasing the amount of metal deposited. The percentage we have noted to be as great as 30%. The argument may be given that a larger amount of current can be used. It can, but not without a questionable effect upon both the deposit and the corrosion of the anode.

The next point to be discussed is the proportions of metal to be used. We will consider both the total metal content and the ratio between the copper and zinc.

A great many, in fact some of the best writers, recommend that equal parts of zinc and copper be used and Fields states that such a solution will be more easily controlled. Our experience disagrees with those proportions. A good color can be obtained from a solution of those proportions and under certain conditions it may be operated. It has been noted that there seems to be a definite ratio between the zinc and copper content of a brass solution. Just what that ratio is we are not prepared to say, but think it inadvisable to operate a solution with over 40% zinc. When the zinc content reaches a point above a certain unknown ratio, but probably 40%, it has been noted that a peculiar phenomenon often occurs, viz., the zinc is in some manner precipitated from the solution, and what is strange is that not only will the excess be precipitated but so much more that a copper red color will be deposited. If the operator is not familiar with the

conditions obtained he decides that more zinc is needed and at once proceeds to add it. It is gradually added again and again, and when it reaches a certain point the precipitation will reoccur. The precipitated zinc will accumulate as sludge at the bottom of the tank. If this sludge is analyzed it will be found to be nearly all zinc. Another strange thing is that no matter how much free cyanide is added to the solution not enough of the zinc precipitate will be dissolved to increase the zinc content of the solution to any appreciable degree. If the sludge is removed, however, and a strong solution of cyanide added, it will readily dissolve. In cold weather the excess, if it may be called such, of zinc is sometimes crystallized and solutions have been seen on which a thick coating of "ice" would form. The anodes and the sides of the tank would also be covered. Analysis proved the "ice" to be the double cyanide of zinc. Copper is never present in these crystals and very little can be found in the sludge. Therefore the conclusion must be drawn that the zinc content has a definite relation to the copper content, and therefore, as stated, it is doubtful whether a 50-50 brass solution can be operated successfully, that is, without any accumulation of sludge and with a perfect control over the metal content.

The amount of metal, that is total metal in a solution, is dependent upon the nature of the work to be plated and whether the solution is to remain still as in a tank or be agitated as in plating barrels operations.

A long series of experiments were made and a record of the results show that above a certain content the metal is only so much money tied up needlessly. A brass solution containing a total of 4 oz. of metal per gallon gave as good a deposit ratio as one having 7 oz. of metal, the current consumption was lower in the weaker solution. Below 4 oz. of metal per gallon the deposit ratio decreased unless the temperature of the solution was increased. The difference of the ratio of deposit between a solution run at room temperature and a hot one while considerable did not compensate for the large decomposition of the free cyanide and the subsequent increasing of density, building up of inert salts and therefore the shortening of the life of the solution.

The study of anode efficiency is one that has received very little attention. It is a most important part of the operation of a solution and when efficiency and economy of operation are considered it is of vital importance. Too much emphasis can not be placed upon the value and necessity of a closer observation and a more careful study of anode efficiency. The results that can be obtained are so gratifying and the control of the content of the solution so much more easy that one is ashamed to acknowledge that more attention has not been given to it. The general procedure in replenishing is to add a certain amount of metal salts, or chemicals to a solution, at stated intervals regardless of whether they are actually needed. The habit has been formed

and the imagination must be satisfied. We heard of one plater who always kept his solutions just at the right point by adding a definite amount of copper carbonate and cyanide each day. Upon being asked if he cared to tell just how much he added he reluctantly gave up his secret. One-half ounce of carbonate of copper and two ounces of cyanide were added to a 250 gallon copper solution at the end of each day's work. He had it figured down to an absolute nicety, yet failed to realize that he could have obtained a 100% anode efficiency.

We operated a silver solution for nearly eight years and had 100% anode efficiency. We know of a 1,600 gallon copper solution that has been run for 16 months with no addition of any metallic salt, nor has the solution been replenished by a porous cup. In corresponding with our esteemed secretary, Mr. Fraine, he stated that he had operated a copper solution for a very long period with 100% anode efficiency and what is probably more remarkable, he has had better than 100% anode efficiency in a nickel solution. It can be done and is being done successfully and the plater who is continually adding to his solutions has not learned how to save himself much trouble. We do not know how others do it and the method followed is nothing new, the only "secret," and we use that word as a quip, is to keep a solution as free from salts that do no real good, as possible, avoid contaminating a solution with a lot of inert salts, do not under any circumstances resort to "doping" the solutions, use chemicals and metallic salts of known content and lastly keep the free cyanide at a standard. In a copper solution it has been found that a good rule to follow is to keep the cyanide content about ½ to 1 ounce lower than the metal content; in a brass just a trifle above the copper content. For example, a copper solution containing 3 oz. of metal to the gallon should have from 2 to 2½ oz. of free cyanide. A brass solution having 3 ounces of copper and one ounce of zinc should have tbout 3¼ oz. of free cyanide. Titration for free cyanide can be made daily a short time before finishing at night and a chart kept so that a definite knowledge of the consumption of free cyanide may be had. Soon weekly reading is all that will be necessary. Bear in mind, though, that the success of anode efficiency depends upon simplicity in the construction of a solution. Use no salts of a doubtful value; don't think a solution gets sick every day and needs your medical advice; use good water in supplying for mechanical loss and evaporation and again don't add any quack dope.

Just one more point and then we are through. Get a line on your current. Study the necessary voltage and amperage for each solution. A great deal depends upon the proper current control and it probably should have been mentioned it plays a most important part in anode efficiency. If too strong a current is used the metal is not corroded at the anode properly. Instead of being in a state that is readily soluble in the solution a coating

of partially or slowly soluble and maybe insoluble salts are formed. Even in a well proportioned solution a strong current will cause a dark coating on the anode which will be released and float around the solution, causing rough deposits and finally settling as sludge in the tank. If not enough current is used there is not sufficient corrosion to supply the metal taken from the solution and therefore cause impoverishment. How much current should be used is a matter of local conditions. The state of the solution itself, its density, its resistance due to the impurities and inert salts present and the size and kind of lead wire all have an important effect on the current consumption. The purity and composition of the anode itself is important. Sometimes additional agents are added to a solution as a brightener or to increase the rate of deposit. When these are used a larger amount of current to be employed is generally recommended. This is especially true of the several rapid nickel salts with which the plating trade has been afflicted. In using the stronger current it will be found that the anode will corrode very rapidly and the answer is that the solution is being replenished, but the point of just replenishing is often overstepped and much metal can be found in the sludge at the bottom of the tank. The rapid deposit is obtained, but the deposit will generally be found to be very little heavier, if any, than if the same current density was used on a regular bath, and it will be at the expense of the anode.

The current should corrode the metal just sufficiently so that the anode will be kept nearly clean and clear. Anode efficiency can not be obtained with a coated anode. To refer to an old bone of contention our opinion is that a nickel anode should be kept clean if the solution is to be replenished from it. Mr. Fraine, in his experiment with nickel solutions, proved this when he used pure shot nickel anodes which contained no impurities to coat over the anode and obtained over 100% anode efficiency.

In conclusion let me state it is my belief that there is no need of patented plating salts. A close study and the proper manipulation of the present known solutions will give better results than any unknown mixture. Let simplicity in construction and hard common sense based upon actual conditions be your prime factors in operating a plating solution.

We should no longer act or be treated as infants. We are entering into the period of our full growth.

MR. PROCTOR'S ADDRESS

Mr. President, Members and Guests of the American Electro Platers' Society:

In the past few days you have again been making history for the American Electro Platers' Society and the craft in general. It is with a feeling of elation that I congratulate the retiring officers for the splendid work they have accomplished during their now expired term, and I have reason to believe, and the society expects, that the work they have accomplished during the past year will only be an incentive for future work for the uplifting and upbuilding of the splendid structure of the American Electro Platers' Society. The society needs the assistance of every ex-official, because their hands have handled the working tools that spreads the cement that unites us into one splendid society of fellowship, working together for one common cause, the uplifting and the upbuilding of our adopted profession and chosen art. What you have accomplished is of the past, what you can accomplish now belongs to the future.

I am sure your hands, your brains are not yet of the past, but of the future, and you can and will no doubt continue the splendid work that you have so lavishly given to our common cause. We put forth our hands and hold you as a link in the chain of universal brotherhood. Each link of that chain is as strong as human ties can make them, and we desire to so weld each link of that chain that you may become one and inseparable with us in the future work of the society as you have been in the past year, and in the previous years of your connection with the society.

It is needless to inquire from you, are you equal to the task. I know it, and as I look into your faces, they reflect your intentions; your mind is an open book; there are pages therein yet to be inscribed and their inscriptions will be to the honor and welfare of the American Electro Platers' Society.

But the past is of the past, and we must now look toward the future. The future work of the American Electro Platers' Society is yet to be inscribed upon its pages of history and it is to you, gentlemen, who have been chosen by the delegates representing each and every individual branch of the society that we look forward to, that we place our utmost confidence in to guide the future destinies of the society; it is to you to whom we now intrust the future work of the society. You have been elected to its high offices, not without friendly rivalry, but in the end for one specific purpose only, that in you we have by choice, decided that your best efforts will be put forth, that you will all work shoulder to shoulder, carrying out the precepts and the fundamental principles that underlie the structural work, or rather constructive work of the society. Unbiased by friends or for mercenary motives, you have accepted the prerogatives of our society in accepting the working tools of the Supreme Soci-

ety. We know they will be used in spreading the cement that will unite the building into one common mass of faith, hope and justice. And, in that building, which you will continue to erect, within its portals there should be no contention save that noble contention, or rather emulation of who can best work and best agree for the honor and best interest of the society.

And so, gentlemen, I myself and every true member of the society wherever he may be, pledges to you loyalty and fealty, and will help and sustain you in every effort you may put forth that may be to the best interests of its members and the society at large.

I have mentioned the future work of the society, but my meaning does not apply to the routine official work of the society. There is other and greater work that I desire to call your attention to than routine work. Our society represents the composite of Science and Industry, and in this industrial age of competition, it means production, it means economy, it means the best effort of our members to produce economic results, so that this great country of ours may stand in the foremost ranks of industrial progress, which may only accrue from their united efforts as far as their particular application applies to the science and industry and economic production of manufactured products, of which the electro plating industry is so essentially an important part in the production of a thousand articles or more that are a part of our home and commercial life of today. The science of electro plating plays a very important part. It behooves you, gentlemen, that a part of your future work should be an effort of elimination of excessive costs and a more economic application of the essentials that will bring the plating industry to the proper economic basis to which it, of right, belongs. What I have in mind is the elimination of the excessive patent medicine and nostrum propositions that are continually being put forth by firms to make capital out of the plater and his employer to his detriment.

There was a time in the years gone past and I might say to a more or less extent in the present, when the plater bunkoed his employer, if I may use such a term, by purchasing materials in endless variety that in many instances had no connection or distinct bearing whatever in regard to his product, that were purchased to create delusion, to create mystery and secrecy in the manipulation of his solutions. That age has passed, or if not, it should be. The manufacturer looks at the plating department from a different angle; now that angle of the inclined plane means economy in production.

But now in turn, the plater is being bunkoed as well as his employer from simplicity and practical application of known principles and factors in the manipulation of his solutions and in the preparation and finishing his product.

He is offered each day an ever increasing line of what I

may aptly term patent medicine plating nostrums. He is offered cleaners galore that are essentially the same product, but are sold under fancy names at about three times the normal value, if they were sold under their common commercial names, of cauterized soda ash, sodium hydrates and aluminum silicates. He is confronted with a never ending line of plating salts, all having fancy names and sold at an excessive price when compared with the actual price and value of the prime factors, the metal and its reducing agent; he is offered substitutes for cyanides which, based upon their cyanogen contents, cost at least two dollars a pound as compared with the 20-cent price or less of cyanides under the proper name. Combinations of carbonates of copper and ammonium sulphates sold under the name of oxides of copper; copper carbonate that is sold that contain 40% ground sulphate of copper; sal ammonia that contains 50% of common salt; other substitutes galore that have been weighed in the balance of practical experience and found wanting.

Gentlemen of the Supreme Society, this is a part of your future work—the elimination of nostrums and the standarizing of commercial chemical products in the plating industry. The manufacturer who pays the price, the honest plater who is deceived in the product he buys, will work with you to evolve the elimination of such costly products that detract from the purpose of economy. The American Electro Platers' Society should create a bureau of commercial chemical standards and every chemical product used in connection with the plating industry should bear the stamped approval of the society. The plater should know absolutely what the product he purchases consists of; he should know the minimum percentage of the basis material or of its compound parts; every legitimate manufacturer of commercial chemical products used in plating will welcome such an innovation, because it will put all such manufacturers upon a strict legitimate basis and insure honest competition. The manufacturer of metal goods that plates his product will welcome every effort you may put forth to bring such desired results and be willing to assist financially in the most important problems. The plater and the manufacturer should refuse to purchase material that does not bear the stamp of approval of the American Electro Platers' Society.

This is one of the most important features of the future work of the American Electro Platers' Society without fear or favor or in the words of the immortal Lincoln—"With malice toward none, with charity for all." Honesty and honesty of purpose is the best and only incentive for the individual's as well as the nation's welfare.

Another important work of the society is to bring about the emancipation of the platers' supply houses from paying tribute to the plater to use his products; to the plater who pays tribute at the expense of his employer, to use a certain product because

the supply house was instrumental in obtaining him a position upon the promise to use only the goods of their handling or manufacture. Unfortunately, this is carried out to an alarming extent. The nefarious practice should be stamped out and the culprits ostracized from the benefits of the society. The names of such individuals or dealers should be published so that the penalty should fit the offense. This is organized graft pure and simple, and must be stamped out. No honest member of the society will permit such conditions to exist, although it may seem difficult, it must eventually get to the root of the evil to destroy the branches of the tree of organized graft in whatever form.

Another important work of the society is an effort to produce some basis of standardizing the plating solutions—to produce the most economic results in production. This work, no doubt, will be somewhat difficult, but it is far from impractical. What the society needs is the co-operation and the financial aid of all manufacturers who are interested in the electro-plating of his product, upon the most scientific and economic basis it is possible to accomplish.

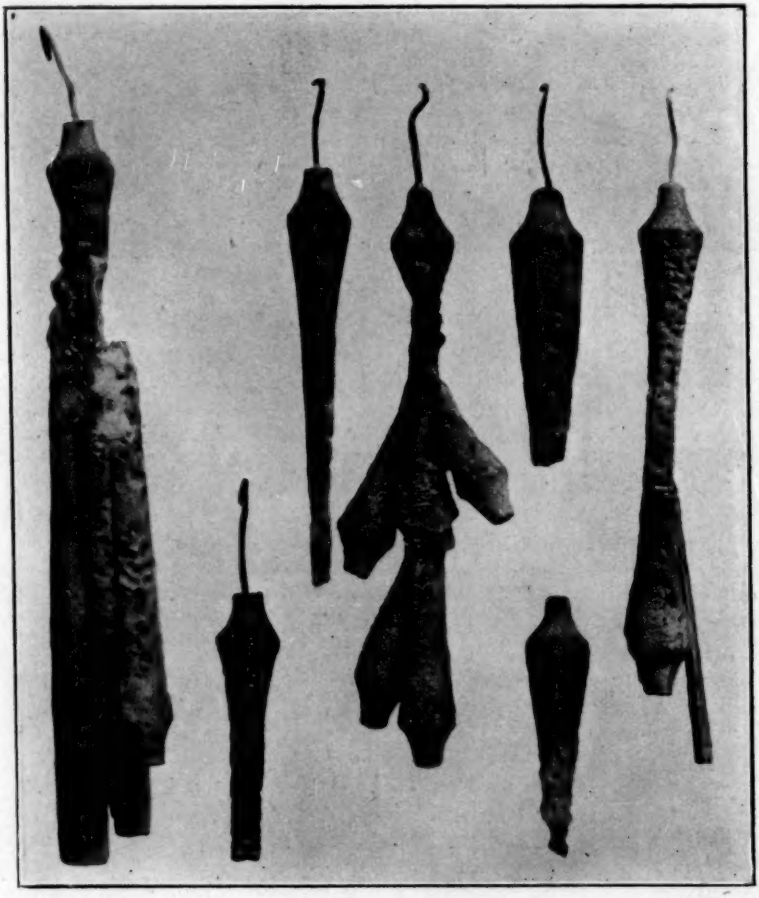
It is possible to enlist the aid of the government in this important work through the Bureau of Standards in Washington. Funds are not at present available, but they can be created. Recently, I spent some time in Washington and had an interview with some of the prominent officials of the Bureau of Standards. Mr. Stratton, the director, was absent at the time. I was assured of the co-operation of the Bureau in connection with the American Electro Platers' Society in an effort of standardization, providing we can get the manufacturers to interest themselves in the proposition by writing to the Director of the Bureau of Standards, voicing their sentiments of the importance of the work the bureau can accomplish by their co-operation in producing such desired results of practical standardization.

Gentlemen, I fear I have already taken up much more time than allotted me, but I wished to present for your earnest consideration some of the important points in the future work of the society. Such work, if accomplished, will assist in placing the society upon a firmer and more important basis, because the present age is of the spirit of progress; to stand still is retrogression. The American Electro Platers' Society in the few years of its existence, has kept pace with advance of time. That is the reason why it ranks today as one of the very important societies in the scientific and commercial ranks of today.

Read at Dayton Convention.

WELDING UP SCRAP NICKEL ANODES.

Some important experiments in the welding of nickel anodes by the oxy-acetylene process have just been concluded in the large plating department of The Prest-O-Lite Company, Inc., at its Indianapolis plant. As a result of these experiments and tests, worn nickel anodes which have previously been scrapped and sold at less than half price are now being reclaimed at a saving of more than 100 per cent.



The anodes used by The Prest-O-Lite Co., Inc., are castings of 90% nickel, 8% carbon and 2% iron. They are elliptical bars approximately 1½ in. x 3½ in. cross section and 30 in. long and weight about 30 lbs. Their market value varies between 46 cents and 50 cents per lb. On the basis of the latter price, each 30 lb. anode has a value of $15.00.

By welding up old anodes which have been in the solution, and which have a junk value of between 22 cents and 25 cents per lb., The Prest-O-Lite Co., Inc., is now converting its entire pile of scrap nickel into what are practically *new anodes* at a total cost for gas and labor of *less than 6 cents per lb.* This estimate is based on a recent test at Indianapolis in which 421 lbs. of scrap anodes were welded up at the following costs:

463 cu ft. oxygen	(@ 2 cents).....	$ 9.26
480 cu. ft. acetylene	(@ 2 cents).....	9.60
24 hours labor	(@25 cents).....	6.00
	Total.....	$24.86

In view of the fact that this test was made before any experience in the operation had been gained, it is apparent that better results and greater savings are sure to be the result of practice.

The method of handling this operation is about as follows: As the anodes are eaten away by the solution they are turned over to an oxy-acetylene welder, who "tacks" on scraps of old anodes by welding to increase the surface. One, two, three and sometimes four pieces of scrap are welded on, depending on the size and weight desired.

The welding flame is also employed to remove the brass hooks which are used to support the anodes while in solution. Under the intense heat of the oxy-acetylene flame, (approximately 6,300° F.) the solder melts away rapidly, leaving a pure nickel bar, which is later welded up.

Thus, by the addition of from, say, 5 to 15 lbs. or more of scrap nickel, a brand new anode is manufactured at trifling cost and every bit of scrap is utilized without the loss of a single pound of metal.

No flux is employed, as this has been found to be unnecessary. The pieces of scrap are simply melted on or "fused" together using another piece of nickel as a filling rod.

The welding process is a great benefit in obtaining perfect fusion, which is essential, as all joints must have electrical conductivity equal to that of new anodes.

Another great advantage is the fact that no skill or experience in the art of oxy-acetylene welding is required to weld up scrap nickel anodes. In fact any workman with average intelligence can do the work without any previous knowledge of the process. The apparatus required to do the work is inexpensive.

Many previous attempts have been made to utilize scrap nickel anodes, the most common practice being to drill holes through several pieces and bind them together by means of lead rivets. This method depends upon the contact of the wire or rivet and the piece of scrap to conduct the current and is therefore of uncertain value and in many cases a flat failure. If, for any reason, the contact is bad and offers too much resistance to the current of electricity, the metal might or might not dissolve. Therefore, by using the welded

anodes, as much scrap may be used in a tub as is desired without any danger of depleting the solution of metal.

The welding process solves an important problem in the nickel plating industry, as hundreds of tons of scrap nickel anodes can now be utilized at the same value as new anodes and at trifling cost.

The Prest-O-Lite Co., Inc., estimates that more than a ton a year of scrap anodes can be used in its plating department.

Sent in by James J. Walch, Indianapolis Branch.

WHAT THE BRANCHES ARE DOING

All matters for this department must be in the hands of the editor by the 7th of the month. Anything received later than that date will be held for publication the following month. Send all communications to J. H. Hansjosten, R. R. No. 5, Kokomo, Ind. —Editor.

SUPREME SOCIETY

Meets first week in July, 1916, at Toronto, Ont. Secretary, Walter Fraine, 507 Grand Avenue, Dayton, Ohio.

NEW YORK

Metes fourth Friday of each month at Broadway Central Hotel, New York City, 8 P. M. Secretary, Joseph Minges, 148 Schenck Avenue, Brooklyn, N. Y.

The regular monthly meeting of the New York Branch was held Friday evening, June 25th, at the Branch rooms, 258 Pearl street.

The newly-elected officers were installed and the report of our delegate to the convention was read. The changes made in the constitution were commented on.

A demonstration of Cobalt plating was made by Mr. Charles Buchanan, which held the interest of every one.

The third annual outing was a success. It was decided to have but one meeting a month during July and August and to take up laboratory work again in September.

PHILADELPHIA

Meets first Friday of each month in the Harrison Laboratory Building, University of Penna., 34th and Spruce Streets, Philadelphia, Pa. Secretary, Philip Uhl, 2432 North Twenty-ninth Street, Philadelphia, Pa.

The regular monthly meeting was held July 2nd, with President Samuel Barr in the chair. Although during vacation time, there was a good attendance and a very interesting meeting was held. Mr. Coller, of this Branch, who was a visitor at the Dayton convention, gave a very interesting account of the convention and told the members what a great success that event was. Mr. A. J. Mac-

Dermid, of Bridgeport Branch, was present and was called on for a speech, and made a very interesting talk. In the course of his speech Mr. MacDermid also spoke of the splendid success of the Dayton convention.

Under the head of "Good and Welfare," a general discussion was held on "Metal Finishes," that proved to be not only very instructive, but so interesting that we will have more of it at future meetings. Philadelphia Branch is growing, not only in membership, but also in everything that our Society stands for. Its members are for the ideals of the A. E. S.

BRIDGEPORT

Meets third Friday of each month at the office of the Brass World, 260 John Street, Bridgeport, Conn. Secretary, Nelson Barnard, 858 Howard Ave., Bridgeport, Conn.

CHICAGO

Meets fourth Saturday of each month, 8 P. M., Western Building, Randolph Street and Michigan Avenue. Secretary, H. E. Willmore, 5911 South Boulevard, Chicago, Ill.

NEWARK

Meets first and third Friday of each month, 8 p. m., 47 Bank Street, Newark, N. J. Secretary, George Reuter, Jr., 333 So. 19th Street.

On Friday evening, June 4th, this branch held an open meeting which was very well attended. The meeting was opened in due form by President Horace H. Smith.

After the regular business had been transacted, Mr. Joseph L. Denan, President of the Philadelphia Branch, made some brief remarks, after which he installed the new officers. He gave them brief instructions as to their duties and reminded each one of the importance of his office.

Under Good and Welfare, a paper composed by Mr. Charles Buchanan and read by Mr. Thomas B. Haddow, was presented. This paper dealt with the Electro-Deposition of Cobalt. This paper was very instructive and brought forth the following facts: that cobalt will deposit faster than nickel, does not burn as easily as nickel, and will retain its lustre for a much longer period.

Samuel R. Taylor, the newly elected Librarian, then gave a few demonstrations. One of immersion silvering upon brass articles. The solution used was composed of forty per cent ordinary silver plating solution and sixty per cent water, with about 3 oz. of ammonia to each gallon. Use very hot, without current. This solution will give a bright deposit of silver upon bright, dipped and polished brass surfaces.

The converting the silver in cyanide solution into powdered metallic silver. This method consisted of precipitating the silver as silver chloride with hydrochloric acid, washing and filtering the precipitate, adding enough hydrochloric or sulphuric acid to cover the precipitate and then adding metallic zinc. As the zinc dis-

solves in the acid the silver chloride precipitate is converted into metallic silver in a brown, powdery form.

The members gave marked attention to the paper and demonstrations and the interest was manifest all through this period.

The following are the newly elected officers, 1915-1916:

President—Edward W. T. Faint.
Vice-President—Lewis H. O'Donnell.
Recording Secretary—George Reuter, Jr.
Financial Secretary—James S. Phelps.
Treasurer—Philip Sievering.
Librarian—Samuel R. Taylor.
Chemist—Charles Piske.
Sergeant-at-Arms—Harry J. Maurer.
Assistant Sergeant-at-Arms—Theodore Kreuter.
Trustees—Horace H. Smith, John Merigold, Henry Bergsfels.

DETROIT

Meets first Friday of each month at Prismatic Hall, 140 *First Street. Secretary, B. E. Miller,* 545 *Townsend Avenue, Detroit, Mich.*

TORONTO

Meets fourth Thursday of each month at Occidnetal Hall, Bathurst and Queen Streets. Secretary, Ernest Coles, P. O .Box E, *Coleman, Ont.*

CINCINNATI

Meets once each month at Dennison Hotel, Cincinnati, Ohio. Secretary, F. H. Nordman, 720 *Froom Ave., Cincinnati, Ohio.*

BUFFALO

Meets first Saturday of each month at the University of Buffalo, 8 *P. M. Secretary, John G. Murphy,* 71 *Dingens Street, Buffalo, N.Y.*

ROCHESTER

Meets second and fourth Friday of each month at University of Rochester. Secretary, C. V. Haring, 603 *Dewey Avenue, Rochester, N. Y.*

This Branch will meet at the Osborn House on the second and fourth Friday of each month during the summer months. C. V. Haring, Secretary, 603 Dewey Avenue.

At the regular meeting, held June 11th, all the officers were re-elected. The laboratory at the University is being enlarged and remodeled, and for that reason the Branch will meet at the Osborn House as stated above.

Our delegate, Mr. S. P. Garthland, gave a very interesting account of the convention, and was much pleased with the manner in which Dayton entertained the delegates and visitors.

DAYTON

Meets first and third Wednesday of each month at the Y. M. C. A., Dayton, Ohio. Secretary, Alphonz Lamoureux, 500 *East First*

Street, Dayton, Ohio.

ST. LOUIS

Meets fourth Saturday of each month at Public Library Assembly Rooms. Secretary, H. H. Williams, 2134 Nebraska Avenue, St. Louis, Mo.

At our last regular meeting the following gentlemen were installed in the offices to which they were elected: President, H. H. Williams; Vice-President, H. J. Richards; Secretary-Treasurer, Frank C. Rushton; Librarian, C. S. Weygandt; Board of Managers, E. J. Musich, J. T. McCarthy, and George Saukemeyer.

Mr. Robins gave a very interesting talk on the relative merits of single and double nickel salts. His talk was so good that he was requested to repeat it at the next meeting, to be held at Belleville, Illinois, on the last Saturday in July.

Mr. Richards has been making practical experiments in conjunction with Mr. Robins and will present his results.

MILWAUKEE

Meets first Friday of each month at Eagles Hall, 137 Second Street. Secretary, E. C. Yaeger, 962 Ninth Street, Wilwaukee, Wis.

CLEVELAND.

Meets last Saturday of the month at the Central Y. M. C. A. Secretary, Charles Werft, 331 Strathmore Avenue.

Mr. L. C. Bogner, of Fremont, Ohio, has transfered his membership to Toledo Branch.

TOLEDO

Meets every Wednesday at Toledo University, James C. Nagle, Secretary, 209 Navarre Ave., Toledo, Ohio.

INDIANAPOLIS.

Meets last Saturday of each month at Hotel Dennison, Artes Nelson, Secretary, 1617 Shelby St., Indianapolis, Ind.

The regular monthly meeting of this Branch was held at the Hotel Dennison on Saturday evening, June 26th, with President B. F. Aufderheide in the chair. The editor of the "Review," J. H. Hansjosten, and Mr. Chester M. McDowell, one of our members from Kokomo, were in attendance.

A plan was discussed whereby we can reach the platers in the cities contagious to Indianapolis, and as a result of the discussion, we are going to get the name of every plater in this part of the State and invite them to join. Anyone knowing the names of platers located near Indianapolis will do us a great favor by sending them to our secretary.

Elected to Membership.

Morris Metz .....Box 284, Quakertown, Pa.
John R. Law.....662 E. Marshall St., Morristown, Pa.
F. R. Ahlstrand.....3654 North 11th St., Philadelphia, Pa.
Gus. Jelifcek..... .....1901 South Western Ave., Chicago, Ill.
Fred P. Burkel.....540 Liberty St., Aurora, Ill.
George S. Robins.....403 Wright Bldg., St. Louis, Mo.

Applicants for Membership.

Chas. V. Bayer.....2444 S. 20th St., Philadelphia, Pa.
George W. Gilson.....724 Campbell St., Kansas City, Mo.

CHANGE OF ADDRESS.

P. W. Geiger.....3306 Woodland Ave., Philadelphia, Pa.
H. W. Puffer.....East Road and East Blvd., Irondequoit, N. Y.
Drury Harper.....2 Primrose St., Rochester, N. Y.
Chester McDowell.....% Conron McNeal Skate Co., Kokomo, Ind.
Sherman Butcher.....519 East North St., Kokomo, Ind.

President Barrows has appointed Messrs. H. E. Willmore, O. E. Servis and Ernest Lamoureux a committee to edit the amendments to the constitution passed at the last two conventions. They are to edit the various amendments adopted and submit them to the Executive Board for their approval before publication. The gentlemen named by the Supreme President have the confidence of the entire membership and the ability to do the work assigned to them as it should be done.

On Saturday evening, July 17th, the platers of South Bend and vicinity will meet at the Oliver Hotel to form a Branch of the American Electro-Platers Society. Platers from Laporte, Mishawaka, Elkhart and Goshen, Indiana, and from St. Joseph, Benton Harbor, and Dowagiac, Michigan, are expected to be present. Mr. Harry C. Elmore, Secretary of the Wilmore Corporation, and member of Dayton Branch, is the leading spirit in the movement, while Messrs. John Lockerbie, Joseph Emmett and A. A. Nelson, members of Chicago Branch, are repeating the good work they did at the organization of Chicago Branch a few years ago. With men like those mentioned furnishing the motive power, why, just keep your eye on South Bend Branch.

One of the features of the South Bend meeting will be a Cobalt demonstration. Mr. Elmore informs us that already a number of superintendents of plants and others interested in plating have signified their intention of being present. All visitors are requested to be at the Oliver Hotel at 7:30 o'clock and from there they will be taken to the demonstration plant.

"Honor and shame from no condition rise—
Act well your part, there all the honor lies."
—*Pope.*